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United States	Forest	Intermountain	324 25th Street
Department of	Service	Region	Ogden, UT 84401-2310
Agriculture			

File Code: 2210
Route To:

Date: July 10, 1997

Subject: Regional Rangeland Inventory and Assessment

To: Director, VM

We have been working on how to assess rangeland health and what parameters that assessment should include. Cooperative approaches to rangeland health assessments are being made with Bureau of Land Management (BLM), Natural Resource Conservation Service (NRCS), and Range Extension; Continuous Forest Inventory (CFI) and Forest Inventory and Assessment (FIA) data collection and analysis; and Forest Plan Capability and Suitability Guides. Most of this work has focused around the proper functioning of rangelands.

Recently, the emphasis has been on whether a rangeland health determination could be made at a large scale using rangeland cover types and a ground cover assessment. Health, in this instance, was defined as a properly functioning rangeland if there is an adequate ground cover for the specific vegetative cover type involved to keep the soil/watershed physical components intact for sustainability and recoverability.

A test was run comparing Ashley range trend data with grid plot (FIA/CFI) data (Appendix 5). The test was not conclusive because ground cover data was not collected on all CFI plots. There was enough other data to suggest that if ground cover data is collected through a permanent grid plot, a properly functioning rangeland health categorization can be determined. The results of this test led to a national recommendation on how to take a first look in determining rangeland health (see enclosed 2210 letter dated July 7 to the Director of Range Management).

The premise for conducting the Ashley test was to use the ground cover data published in the Regional Amundson Team Draft Properly Functioning Condition (PFC) Process manuscript dated December 23, 1996. The first step was to verify the ground cover recommendations. A data set was analyzed (Appendix 2) using Forest ground cover summarizes (Appendices 3 and 4). References for this data are in Appendix 6.

?Director, VM

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This analysis supports a proposed revision of ground cover recommendations (Appendix 1) by cover types given in the Amundson PFC Report. We suggest the Amundson team be reconvened to review these recommendations and modify the PFC publication. This is important because Forests are using the PFC process for

many planning purposes, including Forest Plan revision, watershed analysis, and rangeland grazing capability guide revisions.

/s/ Curt Johnson

/s/ Van Elsbernd

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Subject: National Rangeland Inventory

To: Director, RGE/WO

A Memorandum of Understanding (MOU) was recently signed between the Forest Service, Bureau of Land Management, and the Natural Resources Conservation Service. One purpose of this MOU is to develop and standardize an inventory to assess the status of public and private rangelands. We have been working with Research and our Interagency partners over the past few years on how to assess rangeland health and what that entails, from subjective ratings and ocular estimates, to detailed data collection schemes.

A minimum assessment of rangeland functionality could be defined as keeping soil/watershed physical components intact to provide for sustainability and recoverability. One method to measure physical functionality is ground cover. Ground cover would be anything that is not bare ground or rock less than 3/4-inch (Region 4's standard), including vegetation, litter, rock, moss/lichens, and cryptogams. Most people could accomplish point sampling of ground cover with minimal training. Cost would also be low because a ground cover 400 point sample transect can be read in 30 minutes. This determination could then be tied to the Riparian Initiative, which uses proper functioning concepts as a minimum standard for assessing riparian.

Work has been on going with National Forest System's Continuous Forest Inventory (CFI) and Rocky Mountain Research Station's Forest Inventory and Assessment (FIA) groups on this minimal process. Recommendations for ground cover standards by vegetative cover type to determine a proper functioning rangeland have been made for the Intermountain Region. Preliminary data taken on the Ashley National Forest shows this basic functionality determination could be expanded on a broad scale using a fixed grid plot design for our rangelands. Repeated measurements would allow trend determinations of basic rangeland cover functionality. Our ground cover, vegetative type functionality data, and the Ashley test data can be shared if desired.

We recommend the Federal Interagency Rangeland Health Committee strongly look at ground cover as a quick, easy, low cost, beginning assessment method to determine the basic functionality of our Nation's rangelands.

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APPENDICES PREFACE:

These appendices contain analyzes and recommendations for proper functioning condition (PFC) of Intermountain Region rangelands as defined by ground cover. Ground cover is defined as everything except bare ground and rock (erosion pavement) less than 3/4 inch.

Ground cover is a quick and easily assessed rangeland attribute that generally relates to rangeland health. Proper functioning rangeland watersheds at any scale might correlate to a protective ground cover that provides for a basic functionality. Functionality is defined as sustaining the watershed components to provide for stability and recoverability of physical components.

The Appendices include:

- Appendix 1 Ground Cover for Proper Functioning Condition by Cover Type.
- Appendix 2 Compilation of Summarized Ground Cover by Cover Type;
Supporting Information for PFC Ground Cover
Recommendations.
- Appendix 3 Ground Cover Data Summaries from Various Sources by Cover
Type.
- Appendix 4 Fishlake National Forest Landtype Association Ground Cover
Data.
- Appendix 5 Ashley Range Trend and Ashley FIA Grid Ground Cover Data.
- Appendix 6 References and Data Sources for Rangeland Ground Cover.

APPENDIX 1

Ground Cover for Proper Functioning Rangelands:
Regional PFC Assessment and Refinement Recommendations.

	Amundson Team	Johnson/Elsbernd
Cover Type	Regional PFC Process	Range's Recommendation
	% Ground Cover	% Ground Cover

Alpine	> 80%	> 90%
Aspen	~ 100%	> 80%
P-J	> 80%	> 60%
Mtn Mahogany	> 75%	> 75%
Gamble Oak	> 80%	> 75%
Tall Forb	> 90%	> 65%
Mtn Brush	-	> 70%
Sage(Artrv)/Grass	> 80%	> 70%
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APPENDIX 2

Compilation of Summarized Ground Cover Data by Cover Type
Followed by PFC, Mid and PNC Recommended Ground Cover (*)

Cover Type Source/Forest	Ave Low Cover	Ground Cover Average Cover	Average High Cover
Alpine			
Bridger-Teton	85%	98%	100%
* Recommendation	PFC 90%	Mid 98%	PNC 100%
Aspen			
PNC Scorecards			100%
Bridger-Teton	85%	99%	100%
Fishlake	80% (49-95%)	85%	96%
Humboldt-Toiyabe		85%	
Caribou	73%	84%	96%
* Recommendation	PFC 80%	Mid 85%	PNC 95%
Pinyon-Juniper			
Fishlake	63% (48-82%)	73%	83%
Humboldt-Toiyabe	60%		75%
Caribou	49%	71%	92%
* Recommendation	PFC 60%	Mid 70%	PNC 85%
Mtn Mahogany			
PNC Scorecards			95%
Fishlake	74% (63-84%)	80%	89%
Humboldt-Toiyabe		85%	
Caribou	53%	74%	85%
* Recommendation	PFC 75%	Mid 80%	PNC 92%

Gamble Oak					
Fishlake		73% (59-79%)	79%		89%
* Recommendation	PFC	75%	Mid 80%	PNC	90%

Tall Forb					
PNC Scorecards					70-78%
Bridger-Teton		65%	87%		100%
Caribou		33%	53%		88%
* Recommendation	PFC	65%	Mid 70%	PNC	78%

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Mountain Brush					
PNC Scorecards					88-100%
Fishlake		69% (54-78%)	80%		87%
Caribou		55%	80%		92%
Caribou		47%	76%		93%
* Recommendation	PFC	70%	Mid 80%	PNC	90%
Sage/Grass (Artrv)					
PNC Scorecards					100-71%
Fishlake		66% (50-70%)	76%		86%
Humboldt-Toiyabe			80%		
Caribou		50%	74%		92%
Intmtn Rangelands		36%			90%
Bridger_Teton		86% early seral	91% mid seral		93% late seral
* Recommendation	PFC	70%	Mid 75%	PNC	88%

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APPENDIX 3

Ground Cover Data Summaries from Various Sources

Potential Natural Community Ground Cover Data from Scorecards

PNC Community	Location	% Ground Cover	
Tall Forb	Elk Knoll M-L	77%	
Tall Forb	Alpine Exc M-L	70%	
Tall Forb	Cross Lake B-T	78%	
Sage - Grass			
Artrvp/Feid	Pole Crk SNRA granitic	89%	13% Artr shrub cover
Artrvp/Feid	Fairfield/Gooding granitic	67%	
Artrvp/Agsp	Valley Crk SNRA grantic	84%	
Artrvp/Agsp	Stanley grantic	84%	21% Artr shrub cover

Artrvs/Feid	Stanley SNRA grantic	71%	
Artrv/Syor/Agsp	Sawooth	100%	
Artrv/Syor/Agsp	Barlow Crk Sawtooth granitic	80%	
Artrv/Syor/Agsp	Ketchum Spr Crk grantic	94%	
Artrv/Feid	Jarbridge ave 13 sites	88%+6	
Artrv/Stipa	Sublette Sawtooth	82%	15% Artr shrub cover
Artrv/Stipa	Sublette Station Sawtooth	95%	22% Artr shrub cover
Mtn Brush/Artrv/Syor	Jarbridge ave 7 sites	94%+6	
Amal/Artrv/Syor	R2 scorecard	94%	

Caribou Ecosystem Stratification Ground Cover Data

Cover Type	Minimum Cover Recorded	Average Cover	Maximum Cover Recorded
Aspen	63%	84%	96%
Juniper	49%	71%	92%
Mtn Mahogany	53%	74%	85%
Tall Forb	33%	53%	78%
Mtn Brush	47%	76%	93%
Sage/Grass	50%	74%	92%
Maple (Bigtooth)	55%	80%	92%

Humboldt - Toiyabe Ecology Team Ground Cover Data

Aspen	85% ground cover or better	
P-J	60-75%	
Mtn Mahogany	>85%	Maximum reading 95%
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Bridger-Teton Ecology Team Ground Cover Data

Cover Type	Minimum Cover Recorded	Average Cover	Maximum Cover Recorded
Alpine	85%	98%	100%
Aspen	85%	99%	100%
Tall Forb	65%	87%	100%
Grassland	50%	90%	100%

	Early Seral	Mid Seral	Late Seral
Sage/Grass - each			
Line a Summary			
of a Landtype	75%	86%	91%
	79%	93%	93%
	83%	92%	93%
	-	97%	90%
	87%	95%	94%
	96%	87%	94%
	91%	89%	99%
	92%	91%	93%
Average	86%	91%	93%

Range	(75-94%)	(86-97%)	(90-99%)
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Ashley NF DFC Descriptions - Given as a percentage of PNC Ground Cover.

Cover Type	PNC Ground Cover
Aspen	100%
Mountain Brush	100%
Sage/Grass (Artrv)	95%

Intermountain Rangelands - NRCS Technical Bulletin 1669, Table 3.

Cover Type	Average % Ground Cover for a 10 Year Period
Artrv/Putr/AGRO	59%+5%
Artrv/Putr/ARGO	80%+11%
Artrv/Putr/Erhe2	42%+6%

? APPENDIX 4

Fishlake National Forest Ecological Units
Each Line is a Summary of Ground Cover of a Landtype Association

Cover Type	Minimum Cover Recorded	Average Cover	Maximum Cover Recorded
Aspen	67%	79%	92%
	79	88	96
	88	93	98
	78	87	98
	76	82	97
	89	92	95
	92	94	97
	74	84	94
	73	83	94
	76	86	95
		79	
		73	
	60	74	88
	49	68	87
	64	63	89
	85	93	100
	94	96	98
	77	85	92
	89	94	99
	87	94	100
	84	90	95

	69	90	95
	91	96	100
	86	92	98
	95	97	99
	89	92	94
	89	94	98
	77	86	93
	81	92	100
	90	95	100
	75	87	98
	71	79	87
	80	84	88
	73	84	94
	82	88	94
	78	87	95
	83	91	98
Average	80%	82%	96%
Range	(49-94%)		(87-100%)
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Fishlake National Forest Ecological Units
Each Line is a Summary of Ground Cover of a Landtype Association

Cover Type	Minimum Cover Recorded	Average Cover	Maximum Cover Recorded
Pinyon-Juniper			
	52%	67%	82%
	59	70	80
	58	70	82
	61	72	83
	61	74	87
	82	80	88
	56	64	77
		74	
	56	70	84
	72	80	88
	48	67	83
	67	77	86
	68	73	78
	68	73	79
	64	74	93
	82	84	86
	66	74	82
	65	72	80
Average	63%	73%	83%
Range	(52-82%)		(77-93%)

Fishlake National Forest Ecological Units
Each Line is a Summary of Ground Cover of a Landtype Association

Cover Type	Minimum Cover Recorded	Average Cover	Maximum Cover Recorded
Mountain Mahogany			
	75%	77%	80%

	63	73	83
		60	
		90	
	84	87	90
	76	85	95
	74	82	90
	68	80	93
	70	79	87
	67	85	92
	75	84	93
	75	83	90
Average	74%	80%	89%
Range	(63-76%)		(80-93%)

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APPENDIX 4 con't

Fishlake National Forest Ecological Units
Each Line is a Summary of Ground Cover of a Landtype Association

Cover Type	Minimum Cover Recorded	Average Cover	Maximum Cover Recorded
Gamble Oak			
	75%	83%	91%
	68	87	85
	59	72	85
	87	81	86
	65	75	84
	70	80	89
	70	79	87
	80	87	94
	74	82	90
	74	81	89
	78	84	89
	79	86	92
	85	90	95
	79	86	94
	77	85	92
	78	85	91
	67	73	79
	70	79	88
	70	77	85
	70	79	87
Average	73%	81%	89%
Range	(59-87%)		(79-94%)

Fishlake National Forest Ecological Units
Each Line is a Summary of Ground Cover of a Landtype Association

Cover Type	Minimum Cover Recorded	Average Cover	Maximum Cover Recorded
Mountain Brush			
	60%	68%	75%

	71	78	85
		82	
	64	71	87
		84	
	69	80	91
	70	92	97
	78	84	89
	78	80	88
Average	69%	80%	87%
Range	(60-78%)		(75-97%)
?		APPENDIX 4 con't	

Fishlake National Forest Ecological Units
Each Line is a Summary of Ground Cover of a Landtype Association

Cover Type	Minimum Cover Recorded	Average Cover	Maximum Cover Recorded
Sagebrush/Grass (Atrtv)			
	45%	62%	80%
	71	87	83
	59	69	79
	74	78	83
	50	65	81
	55	67	79
	64	75	85
	60	70	79
	45	59	72
	67	76	86
	62	73	84
	63	71	79
	68	79	89
	76	83	90
	67	83	89
	79	85	90
	76	84	91
	73	81	88
	74	84	93
	66	80	93
	75	84	93
	60	75	90
	62	73	84
	67	78	89
	74	81	88
	67	83	88
	77	83	89
Average	66%	76%	86%
Range	(45-77%)		(72-93%)

Fishlake National Forest Ecological Units
Each Line is a Summary of Ground Cover of a Landtype Association

Cover Type	Minimum Cover Recorded	Average Cover	Maximum Cover Recorded
Grassland			
	46%	59%	73%

	41	58	76
		84	
	79	87	96
	72	83	96
	83	90	96
	70	87	85
Average	74%	77%	87%
Range	(41-83%)		(73-96%)
?		APPENDIX 5	

Ashley National Forest Understory Summary of FIA Grid Data and Range Trend Cover Data.

Ashley NF FIA Grid Plot Average Ground Cover Data Summarized by Forest Type.

Cover Type	Percent Ground Cover
Alpine	-
Aspen	97%
P-J & Juniper	83%
Woodlands	
Mtn Brush	-
Sage/Grass	-
Ave for Total	
Forest for the	
Portion Sampled	94%

Ashley Range Trend Data with Corresponding FIA Grid Plot Data.

Range Study Site Number	Cover Type	Ground Cover %	FIA Grid Information
130303 Antelope Cyn	Arno/syor/Artrvp	78%	Not recorded
470038 Grasshopper Flat	Artrvp/Chivl/Pofe	96% (PNC)	Not recorded
471130 Counting Corrals	Pofe/Agda	88% (PNC)	Not Recorded
131221 Nutters Cyn	Arno/Artrvp/Arfr	88%	Not recorded
31-4 Taylor Mtn Exc	Putr/Artrv	96% (PNC)	Not Studied
32-78 Diamond (1 1/2 yr after fire)	Putr/Artr/Agda	74%	Not Studied
471139 Kabell Hollow	Putr/Amal	81%	Not recorded
13032 Wire Fence Ridge	Artr/Chvil/Agda	83%	Not recorded
131233 Nutter Spr	Artrvp/Gusa/Brin	73%	Not Recorded

Because the FIA grid inventory on the Ashley NF did not record ground cover, an accuracy comparison of grid plot data and range trend data could not be made.

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APPENDIX 6

References, Data Sources for Ground and Shrub Cover for Proper Functioning Condition Determinations for Region 4, USDA Forest Service.

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